

**We claim:**

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1. A process for purification of ethylene oxide by distillation, comprising the step in which

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- an aqueous mixture comprising ethylene oxide, formaldehyde and at least 5% by weight of water is introduced via a feed into a distillation apparatus comprising at least one distillation column, the mixture being introduced at a height above the bottom of at least 8 theoretical stages,

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- the ethylene oxide is taken off at the top and

- in the bottom phase, a mixture is obtained which contains less than 5% by weight of ethylene oxide.

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2. A process for purification of ethylene oxide by distillation, comprising the step in which

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- an aqueous mixture comprising ethylene oxide, formaldehyde and at least 5% by weight of water is introduced via a feed into a distillation apparatus comprising at least one packed column which contains a structured or bulk packing and has a specific mass transfer area  $A$ , the mixture being introduced at a height above the bottom of at least  $x_{\min}$  (in m) which, for a given specific mass transfer area  $A$  (in  $\text{m}^2/\text{m}^3$ ), is given by the equation

$$x_{\min} = 5.5 \text{ m} - A \cdot 0.006 \text{ m}^2,$$

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- the ethylene oxide is taken off at the top and

- in the bottom phase a mixture is obtained which contains less than 5% by weight of ethylene oxide.

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3. A process as claimed in claim 2, wherein the aqueous mixture is introduced via the feed at a height of from  $1.5 x_{\min}$  to  $7 x_{\min}$ .
4. A process as claimed in claim 2 or 3, wherein the specific mass transfer area  
10 A is in the range from  $100 \text{ m}^2/\text{m}^3$  to  $500 \text{ m}^2/\text{m}^3$ .
5. A process as claimed in claim 1, wherein the aqueous mixture comprising ethylene oxide, formaldehyde and at least 5% by weight of water is introduced via a feed into a distillation apparatus comprising at least one plate  
15 column, the mixture being introduced at a height above the bottom of at least 12 plates.
6. A process as claimed in one of the claims 1 to 5 which further comprises the step in which a further mixture, ~~principally~~ comprising water, is additionally  
20 introduced via a feed line at a height of at least one theoretical stage or plate above the feed of the aqueous mixture.
7. A process as claimed in one of the claims 1 to 6, wherein flame-arresting packings are used in the distillation apparatus.
- 25 8. A process as claimed in one of the claims 1 to 7, wherein a distillation apparatus is used in which, between the feed and the bottom, there is installed a side take-off via which is taken off a mixture which is enriched with acetaldehyde in comparison with the influent aqueous mixture.

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9. A process as claimed in one of the claims 1 to 8; wherein a distillation apparatus is used in which an intermediate reboiler is situated between the feed and the bottom.
- 5 10. An apparatus for carrying out the process as claimed in one of the claims 7 or 9, comprising a distillation column having a feed (1) at a height above the bottom (4) of at least 8 theoretical stages or, in a plate column, of at least 12 plates above the bottom, a top take-off (3), optionally a side take-off (5), and flame-arresting packings and, optionally, an intermediate reboiler between
- 10 feed (1) and bottom (4).